

REMARKS

Claims 9, 12-14 and 17-19 are now pending in the application. Claims 9 and 19 are currently amended. Claim 20 is canceled without prejudice.

The basis for the foregoing amendments may be found throughout the written description, drawings and claims, as originally filed. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 9 and 12-14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Pailler (U.S. Pat. No. 3,946,706). The Examiner has withdrawn the previous indication of allowable subject matter which encompassed claim 9, as previously presented. The Examiner has stated he too narrowly construed the second axis as being the axis located at the center of the connecting rod 12, whereas the claims merely called for the housing being reciprocal along a second axis, without specifying its location.

This rejection is respectfully traversed, particularly in view of the foregoing amendment to independent claim 9. In particular, claim 9 (as well as claim 19) is currently amended to further recite, in addition to the fixed axis of the shaft being spaced from the second axis, that the journal is circular, and the second axis intersects the center of the journal. It is respectfully submitted that the claimed invention is not disclosed or suggested in any of the cited references.

Pailler discloses an arrangement in which a crankshaft has the center of the main shaft lying on the center line of the piston connecting rod bearing. This configuration of the double eccentric operates in a symmetric mode and produces a sinusoidal wave form displacement curve (*i.e.*, when plotting the housing displacement versus the rotational angle of the shaft). The symmetric mode of operation, however, may result in undesirable mechanical problems at the top and bottom dead center, or at neutral points of the cycle. For example, at mid-stroke in the symmetric mode of operation, there is the possibility that "freewheeling" can occur.

Advantageously, in the claimed invention, by spacing the fixed axis of the shaft away from the second axis – the axis which intersects the center of the journal the apparatus – the claimed invention is able to achieve special displacement characteristics wherein the apparatus has a different (*i.e.*, asymmetric) wave form displacement curve (of the graph plotting the housing displacement versus rotational angle of the shaft). The asymmetric mode of operation of the present invention is significantly different from the symmetric mode of operation of the devices shown in Pailler and the other cited references.

The asymmetric mode of operation resulting from the configuration of the claimed present invention produces a very different displacement characteristic which may be utilized to provide superior properties in, for example, power engines and nautical steering systems. In contrast to the symmetric mode of operation of the devices shown in the cited prior art, the device of the claimed invention exhibits a positive displacement force of rotation at the equivalent to the top and bottom dead center points, which may assist in preventing an unwanted reversal in the direction of rotation.

In view of the foregoing, Applicant respectfully submits that independent claim 9, and dependent claims 12-14 which ultimately depend from claim 9, are patentable and in condition for allowance. Applicant therefore requests that the Examiner reconsider and withdraw the foregoing rejection.

REJECTIONS UNDER 35 U.S.C. § 103

Claims 19 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pailler (U.S. Pat. No. 3,946,706). This rejection is respectfully traversed, particularly in view of the foregoing amendments to claim 19 and the cancellation of claim 20.

Applicant respectfully submits that claim 19 is patentable and in condition for allowance for at least the reasons stated above concerning the rejection under 35 U.S.C. § 102(b). Claim 20 has been cancelled, thereby rendering the Examiner's rejection in this regard moot.

In addition, the Examiner has rejected claims 9, 12-14, 17 and 18 under 35 U.S.C. §103(a) as being unpatentable over Masayoshi et al. (JP 4317461) in view of Kenji (JP 59203801). This rejection is respectfully traversed.

Masayoshi et al. also discloses a device operating in the symmetric mode. As acknowledged by the Examiner, Masayoshi et al. does not disclose the claimed invention but, in contrast, discloses that the axis of rotation is aligned with the center axis of reciprocation.

Kenji shows two versions of a double cam arrangement (Figures 1 to 7). In Figures 1 to 3, motion over a range of 90 degrees is shown. Importantly, the linear

displacement is shown to be $S/2$. This indicates that the motion in Kenji is also in the symmetric mode. Figures 4 and 5 of Kenji show a version of the crankshaft with an offset crankpin. The center of rotation of the main shaft and the crankpin is the same, however, and it lies on the axis of reciprocation intersecting the center of the journal.

Claim 19 recites that the fixed axis of the shaft is spaced from the second axis, and that the second axis intersects the center of the circular journal. It is respectfully submitted that the claimed invention is neither disclosed nor suggested by the cited combination. Applicant respectfully submits that independent claim 19 is patentable and in condition for allowance. Applicant therefore requests that the Examiner reconsider and withdraw the foregoing rejection.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested.

If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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